Journal of Chemical Health Risks

www.jchr.org

JCHR (2024) 14(1), 2549-2553 | ISSN:2251-6727

Treatment of Normal Partially Edentulous and Skeletal Class 3 Partially Edentulous Patients Using Dental Implants and Orthognathic Surgery, Respectively.

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(Received: 27 October 2023 Revised: 22 November Accepted: 26 December)

KEYWORDS

orthognathic surgery, dental implants, class 3 skeletal malocclusion, partial edentulism.

ABSTRACT:

Background: This study was conducted to assess that Treatment of normal partially edentulous and skeletal class 3 partially edentulous patients using dental implants and orthognathic surgery, respectively.

Material and methods: In this study, overall 100 patients with partially edentulous maxillary and mandibular arches were examined. It was found out that 50 subjects had normal skeletal form whereas the other 50 subjects had skeletal class 3 malocclusion. Hence, the subjects were divided into two groups of 50 each. The first group comprised subjects with normal skeletal form along with partially edentulous arches and the second group comprised of subjects having skeletal class 3 malocclusion along with partially edentulous arches. The main goal was the treatment plan for subjects of both the groups.

Results: In this study, the subjects were divided into 2 groups of 50 subjects each. The first group comprised subjects with normal skeletal form along with partially edentulous arches and the second group comprised of subjects having skeletal class 3 malocclusion along with partially edentulous arches. The subjects in first group were planned for dental implants whereas the subjects in the second group were planned for orthognathic surgery. Nerve injury was the most common complication of orthognathic surgery observed in 3 subjects. Total 7 complications were observed in subjects undergoing orthognathic surgery. Infection was the most common complication in subjects receiving dental implants, seen in 5 subjects. Total 11 complications were witnessed in subjects receiving dental implants. It was found that the success rate of dental implants was 78% (39/50) and the success rate of orthognathic surgery was 86% (43/50).

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Conclusion: It was observed that success rate of orthognathic surgery in correction of skeletal class 3 malocclusion was 86% whereas the success rate of dental implants for normal skeletal form and partial edentulism was 76%

Introduction

One of the most important oral health indicators is the ability to retain more number of teeth throughout life. Edentulism or complete tooth loss is prevalent worldwide among older people. Earlier studies have shown that edentulism affects the health and the overall quality of life of the elderly.[1] Earlier studies have shown an association between socio-demographic factors, lifestyles, and tooth loss[1-3] these surveys helps get an information necessary to assess treatment needs. Tooth loss is mainly attributed to dental caries and gum disease. However, factors that lead to tooth extraction are not always dental in origin. The complex interaction between dental diseases, the tendency to use dental care, dental attitude, and affordability of non-extraction treatment have been related to the incidence of tooth loss.[4] Women with a low education level, low economic status, and those who did not brush their teeth showed a higher average of missing teeth.[5]

Skeletal Class III malocclusion is one of the most challenging malocclusions to treat. Skeletal Class III discrepancies can be caused by maxillary retrognathia and/or mandibular protrusion.[6] In around 40% of Class III patients, maxillary retrognathia is the main cause of the problem and in most patients, orthopedic/surgical treatments include some type of maxillary protraction.[7,8]

The use of orthopedic force by extraoral traction for protraction of maxillary deficient patients began in the 1970s.[9] Problems with the growth modification devices in this era were the dental anchorage systems and patients' compliance.[10,11]

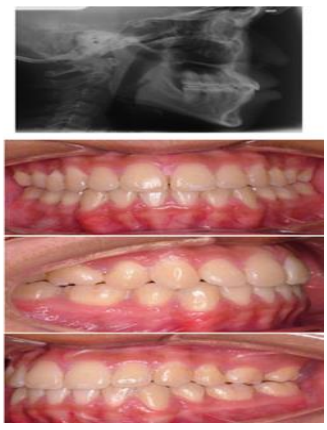
Hence, this study was conducted to assess that Treatment of normal partially edentulous and skeletal class 3 partially edentulous patients using dental implants and orthognathic surgery, respectively.

Material and methods

In this study, overall 100 patients with partially edentulous maxillary and mandibular arches were examined. It was found out that 50 subjects had normal skeletal form whereas the other 50 subjects had skeletal class 3 malocclusion. Hence, the subjects were divided into two groups of 50 each. The first group comprised subjects with normal skeletal form along with partially edentulous arches and the second group comprised of subjects having skeletal class 3 malocclusion along with partially edentulous arches. The main goal was the treatment plan for subjects of both the groups. The subjects in first group were planned for dental implants whereas the subjects in the second group were planned for orthognathic surgery. Statistical analysis was conducted using SPSS software.

Figure 1: Before treatment

figure 2: after treatment



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Results

Table 1: Distribution of subjects in groups.

Groups	Number of subjects	Percentage
Group 1 (Normal skeletal form along with partially edentulous arches)	50	50%
Group 2 (Skeletal class 3 malocclusion with partially edentulous arches)	50	50%
Total	100	100%

The subjects were divided into 2 groups of 50 subjects each. The first group comprised subjects with normal skeletal form along with partially edentulous arches and the second group comprised of subjects having skeletal class 3 malocclusion along with partially edentulous arches.

Table 2: Treatment plan for the subjects of both groups.

Groups	Treatment plan
Group 1	Dental implants
Group 2	Orthognathic surgery

The subjects in first group were planned for dental implants whereas the subjects in the second group were planned for orthognathic surgery.

Table 3: complications of orthognathic surgery.

Complications	Number of cases
Nerve injury	03
Haemorrhage	02
Temporomandibular disorders	00
Hearing problems	00
Infections	01
Relapse	01
Total	07

Nerve injury was the most common complication of orthognathic surgery observed in 3 subjects. Total 7 complications were observed in subjects undergoing orthognathic surgery.

Table 4: Complications of dental implants.

Complications	Number of cases
Infection	05
Peri-implantitis	03
Screw loosening	02
Implant fracture	00
Implant mobility	01
Total	11

Infection was the most common complication in subjects receiving dental implants, seen in 5 subjects. Total 11 complications were witnessed in subjects receiving dental implants.

Table 5: Comparison of success rate of both treatment modalities.

Fate of treatment	Number of cases in Group 1	Number of cases in Group 2
Success	39 (78%)	43 (86%)
Failure	11 (22%)	07 (14%)
Total	50 (100%)	50 (100%)

It was found that the success rate of dental implants was 78% (39/50) and the success rate of orthognathic surgery was 86% (43/50).

Discussion

The differential diagnosis of Class III malocclusion plays an important role in the success of treatment results, and the therapeutic possibilities of such trait mainly depend

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on the developmental age of patient and nature of malocclusion. Nongrowing participants with Class III malocclusion may present with various combinations of dentoalveolar and skeletal problems[12], and mild cases can often be treated with orthodontic camouflage while severe skeletal discrepancies require orthognathic surgery along with orthodontic appliance therapy.

The main objective of surgical orthodontic treatment is to reposition the jaws to achieve an esthetic profile with good occlusion and masticatory function. The type of orthognathic surgery to be performed depends on the culprit jaw and the severity of the sagittal discrepancy. Bimaxillary surgeries are performed when the sagittal discrepancy cannot be corrected by single-jaw surgery or when there are anatomic limitations. General limits for the surgical maxillary advancement are 6–8 mm and that of mandibular setback is 4–6 mm.[13] Johnston et al.[14] reported that bimaxillary surgery is more frequently used procedure (75% cases) and has 3.4 times the odds of fully correcting the ANB angulations than single-jaw surgery.

Hence, this study was conducted to assess that Treatment of normal partially edentulous and skeletal class 3 partially edentulous patients using dental implants and orthognathic surgery, respectively.

In this study, the subjects were divided into 2 groups of 50 subjects each. The first group comprised subjects with normal skeletal form along with partially edentulous arches and the second group comprised of subjects having skeletal class 3 malocclusion along with partially edentulous arches. The subjects in first group were planned for dental implants whereas the subjects in the second group were planned for orthognathic surgery. Nerve injury was the most common complication of orthognathic surgery observed in 3 subjects. Total 7 complications were observed in subjects undergoing orthognathic surgery. Infection was the most common complication in subjects receiving dental implants, seen in 5 subjects. Total 11 complications were witnessed in subjects receiving dental implants. It was found that the success rate of dental implants was 78% (39/50) and the success rate of orthognathic surgery was 86% (43/50).

Honda K et al[15] described a patient involving a skeletal Class III, 36-year-old male patient with a single bilateral anterior partially edentulous maxilla resulting from injuries sustained in a motor vehicle accident; his anterior teeth had been lost for more than 10 years. His lip protruded from the lateral view due to the proclined upper incisors and mandibular protrusion. Because of the facial deformity and inadequate prosthesis of the maxilla, the prosthesis had dropped out repeatedly. Bone deficiency was prominent in the area of the anterior maxillary region and required augmentation for implant restoration. Consultation among the prosthodontist, orthodontist, and patient led to a decision to perform an orthognathic surgery and bone graft before implant treatment. After orthodontic treatment combined with orthognathic surgery, 3 dental implants were placed with simultaneous iliac bone graft for prosthetic rehabilitation. The treatment restored the maxillary dental arch, which supported the upper lip with appropriate occlusion, both esthetically and functionally. After a 2-year clinical follow-up, the orthoprosthesis of the maxilla remained stable, and the patient was satisfied with the outcome of treatment. The combination of orthodontic, surgical, and dental implant treatment could be an option for skeletal Class III patients with bone-deficient, edentulous jaws.

Conclusion

It was observed that success rate of orthognathic surgery in correction of skeletal class 3 malocclusion was 86% whereas the success rate of dental implants for normal skeletal form and partial edentulism was 76%

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